Security Room For Information Technology Facilities

The invention relates to a secure room for devices in connection with information technology, having fireproof side walls with a sealing door, a floor and a ceiling.

Such a secure room for receiving devices in connection with information and control technologies is assumed to be known. This secure room constructed in accordance with EN 1047 is intended to assure, inter alia in case a fire occurs, that the information technology devices are not destroyed over a defined period of time, for example 90 minutes, and can continue to operate in order to secure important control functions and data. As a rule, such a secure room is permanently installed in a conventional room of a building in that, for example, the room of the building itself is appropriately lined.

The object of the invention is based on making available a secure room of the type mentioned at the outset, which assures the required security for information technology devices and can be simply constructed.

This object is attained by means of the characteristics of claim 1. In accordance therewith it is provided that at least the side walls are put together from plate-shaped individual

elements, which are arranged side-by-side, are designed to be fireproof and extend from the floor to the ceiling, that fireproof sealing elements are arranged in the joints between the individual elements and that the individual elements are held against each other by connecting means, which push the sealing elements together. With such a construction, the connection areas between the individual wall elements, which in case of fire are particularly endangered, are sealed in a fireproof manner, as well as against corrosive combustion gases and moisture, so that a temperature rise on the inside of the secure room is being counteracted.

By means of a construction in such a way that the sealing elements have an expanding seal which, viewed in cross section, is arranged in the central area and expands in case of fire and, arranged laterally therefrom, high-temperature seals which withstand high temperatures, satisfactory heat shielding, as well as secure covering is assured in case of fire, if the wall elements become deformed because of the generation of heat. Moreover, a seal against corrosive combustion gases and moisture is assured.

An additional protection against the effects of temperature in the joint areas of the wall elements is achieved in that the sealing groove between the areas at the joints of the individual elements is covered at least on one of the two outer sides by means of a sealing tape

covering the sealing groove, and furthermore, in that the sealing groove is closed off with a sealing material at least on one of its areas adjoining the two outsides.

The transition between the individual elements with a satisfactory sealing effect is aided in that the joint sides of the individual elements are provided with connecting tongues, and that the individual elements are constructed in layers and have outer layers of steel arranged on their outsides, and between them at least two layers which deflect high temperatures away from the interior of the room.

A solid simple connection between the individual elements, wherein the sealing elements are pressed together for increasing the sealing effect and furthermore harmful changes in the wall elements are prevented, is achieved in that the connection means at the outer coverings have connecting elements in the area of the sealing grooves, which have grooves, open at the sides and tapering conically toward the top, and that closure elements, which taper toward the top, can be placed on the connecting elements of adjoining individual elements by means of lateral bevels and can be clampingly fixed in place.

Furthermore, steps are advantageous for simple mounting and definite solid orientation of the wall elements, wherein the undersides of the side walls are inserted into U-

shaped floor profiles, open toward the top, and wherein the seals and the connection means are covered, at least on the inside of the secure room, with profiled linings.

Sealing of the fireproof room is further complemented in that a cable duct for passing cables through is installed in at least one side wall element, which has an outer packing frame with sealing modules received therebetween, and that the sealing modules have feed-through openings for the cables, which have inner walls which can be removed in the manner of onion layers in order to adapt the diameters of the feed-through openings to the various cable diameters.

The invention will be explained in greater detail in what follows by means of exemplary embodiments and by making reference to the drawings. Shown are in:

Fig. 1, a perspective view of a secure room with partially cut open walls,

Fig. 2, a cross section of a portion of the secure room installed in a room of a building,

Figs. 3a) to 3d), various wall elements in a perspective view,

Figs. 4A and 4B, a connection area between wall elements in a plan view from above and a lateral view,

Fig. 5, a support device in a larger secure room,

Fig. 6, an installed door in cross section,

Fig. 7, a built-in element in the secure room, and

Fig. 8, a cable duct between the outside and the inside of the secure room.

In a perspective view, Fig. 1 shows, as the essential elements of a secure room 1, side walls 2 with a door 5, a ceiling 3, as well as a double-deck floor 4, wherein the side walls 2, the ceiling 3 and the floor 4 are assembled in a modular form of individual wall elements. Various components of the information or control technology are housed in the room, as well as an airconditioning device 12 and a light fixture 7. A firefighting device 8 with reservoirs containing firefighting agents arranged on the outside, and lines and outlet openings arranged in the ceiling of the interior of the fireproof room 1, and furthermore a device 9 for removing used fire-extinguishing means, are provided in case of fire. Moreover, an electronic control system 10 is arranged on the outside, while a motion sensor 11 is attached in the interior. An interruption-free power supply 13 can furthermore be provided in the interior. A cable inlet 6 for the current supply for the electrical components arranged in the interior of the secure room 1 is installed in one side wall 2.

Figs. 3a) to 3) show the various wall elements in the form of a side wall element S, a ceiling element D of the same width, a floor element B and a corner element E, whose lateral parts preferably correspond to the width of a side wall element S. In Figs. 2, 4A and 4B the structure of these wall elements can be seen in cross section, as well as their connecting area. In accordance with this, the side wall elements S and the ceiling elements D, and correspondingly also the corner elements E, consist of an outer layer 2.1, or 3.1, made of sheet steel, so that a coffer-like structure is formed and several fireproof layers I, II, III of an insulating material are housed between the two outer layers 2.1, or 3.1, which has a retarding effect in case of fire, so that the maximally permissible threshold value load on the information technology device will not be exceeded for 90 minutes, for example.

The corner area between the side wall element S and the ceiling elements D is covered by means of an angled profiled lining 2.2, wherein the vertically downward oriented leg of the profiled lining 2.2 extends over the connecting area between the side wall elements S and the ceiling element D. The adjoining edges of the side wall element S and of the ceiling element D are complementarily designed in an L-shape, so that the side wall elements S and the ceiling elements D can be easily and clearly put together with good sealing. Sealing means with an expansion seal

2.5 arranged in the center of the cross section, with high- temperature seals 2.6 arranged laterally of the former, with a sealing tape 2.7 arranged on the outside, and with a sealing material 2.8 additionally provided between the sealing tape 2.7 and the high-temperature seal 2.6, are arranged between the long sides of the side wall elements S and the ceiling elements D. The critical connecting points are designed to be fireproof by means of this sealing design. Connecting tongues 2.4 adjoin the sealing means at the front in respect to the wall elements.

For the simple, and yet assured, cohesion of the wall elements in the transition areas, connecting elements 2.9 with grooves, laterally open to the outside and tapering conically toward the top, are formed on the outer layer 2.1, as can be seen in Figs. 4A and 4B. Correspondingly matched closure elements 14, which taper toward the top and engage the grooves, are pressed on the connecting elements 2.9, so that the sealing means are pressed together and a tight connection is created. The connecting areas between the individual wall elements provided with the connecting elements 2.9 and the closure elements 14 are covered, preferably in the interior, by means of a profiled lining 15, which is trapezoidal in cross section. Fastening brackets 18 for built-ins can be attached to the profiled linings 15 in the room interior. The connecting

areas between the wall elements themselves do not have any bores or screw holes which could result in the fireproofing being endangered.

As can be further seen from Fig. 2, the side wall elements S are fixed in place by means of profiled floor sections 2.3, which are anchored in the floor of the building and are U-shaped in cross section, so that the side wall elements S are securely maintained and are simple to install. The ceiling elements themselves can be additionally fastened on the ceiling of the room by means of holders 3.2. The floor 4, designed as a double floor, consists of a lower floor element 4.3 and an upper floor element 4.1, which is at a distance from the latter and fixed on it by connecting means 4.2, and is surrounded as a whole by the side walls 2, so that in this area, too, good sealing assures good fire protection. The light fixture 7 can be arranged in the area of the inner edge between the side walls 2 and the ceiling 3 instead of on a suspended additional ceiling in accordance with Fig. 1, wherein a cable duct 7.1 can also be provided there, for example as in accordance with Fig. 5.

For the tight and fireproof closing of the door 5, a seal packing 5.3 has been inserted all around into door casings 5.1, 5.2 and the door has been appropriately fitted and is constructed of fireproof materials. It is provided with a door closer 5.4 (see Fig. 1).

Fig. 5 shows the support of adjoining ceiling elements D by means of a profiled support 17, extending under the connection point, and of a pillar 16, which is supported under it on the floor and is anchored on the profiled support 17 by means of a head plate 16.1, and on the floor of the building by means of a foot plate 16.2. Cable conduits 7.1 are formed on both sides in the area of the profiled support 17, and lighting fixtures, which radiate obliquely downward into the room, are installed there.

The cable inlet 6 represented in Fig. 1 can be constructed in accordance with the cable duct 19, represented in Fig. 8. The latter has an outer packing frame 19.2, into which sealing modules 19.1 have been inserted for the respective cables. After being installed, the packing frame is radially narrowed by tightening of screws, so that the sealing modules 19.1 are compressed. The sealing modules 19.1 contain shells, which are placed inside each other in the manner of onion layers, so that they can be matched to different cable diameters.

It is possible in a simple manner by means of the described measures to put together secure rooms of various sizes in a modular manner. The structural parts constitute a kit put together of simple elements with correspondingly simple storage requirements.